

The Suitability of EMI Gaskets for Waveguide Applications.



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Introduction to Waveguides

A waveguide is used in electronics and is a solid rod of dielectric or a hollow tube that is usually a rectangular cross section (often pressurized) and used as a path to guide microwaves. A waveguide is basically a transmission line with an emphasis only on waves of higher order modes, that is, waves having components of E or H in the direction of propagation.

The preference for any waveguide system is to have a continuous cross section with no joints. However, this is not practical and so there are inevitably joints or flanges. These flanges are often non-parallel to each other and have a surface roughness and misalignment, which can cause reactive losses that have a major effect on the overall system performance, and so there is a requirement for conductive gaskets. The flange with an EMI gasket, if correctly designed, can help transmit the power across the joint with little or no effect on the signal strength or shape. It is not unusual for a flange to have two gaskets, one for the pressure seal (pure elastomer) and one electrical seal (conductive elastomer).

EMI Gaskets for Waveguide applications

There is basically no difference between a gasket that is used for commercial EMI shielding and waveguide applications in that they all must conduct electricity.

Any gasket chosen for waveguide applications must have a minimum out gassing characteristic since the waveguides themselves are often pressurized and any out gassing of a gasket material could interfere with the pressurization. Additionally, because the waveguide is pressurized, the gasket must have a high durometer so that the high pressure seal can be maintained.

The gasket is also needed to be thermally conductive since the waveguides often run hot and the transfer of heat between the joints is important. The waveguide is typically carrying waves that are greater than 2GHz and therefore any gasket material must have high shielding levels at these frequencies.

The Tecknit Consil C product that is based on silver plated copper particles has all of these parameters.

